

NAME: _____

DATE: _____

Unit-2 Mastery Assessment (version 625)

Question 1 (10 points)

Let f represent a function. If $f[2] = 19$, then there exists a knowable solution to the equation below.

$$y = 4 \cdot f\left[\frac{x+39}{21}\right] - 27$$

Find the solution.

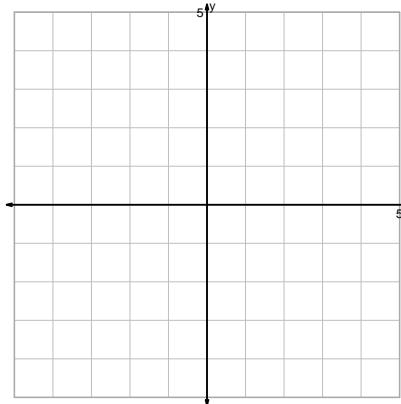
$x =$

$y =$

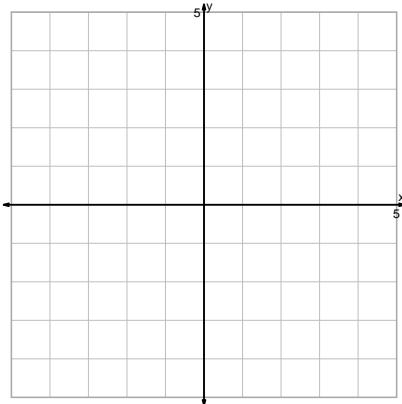
Question 2 (20 points)

Graph the equations accurately. For each integer-integer point on the parent, indicate the corresponding point precisely. Also, with dashed lines, indicate any asymptotes.

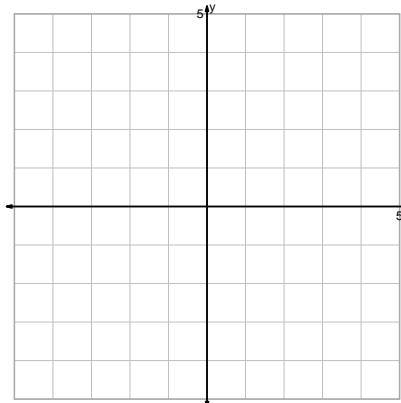
$$y = \frac{x^2}{2}$$



$$y = \sqrt{x} + 2$$



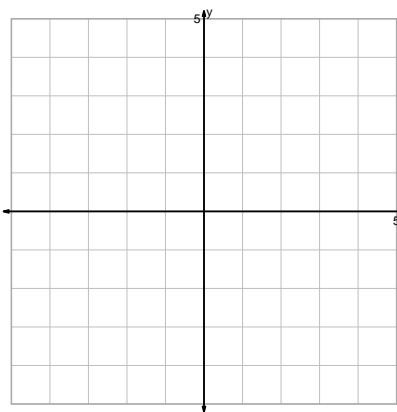
$$y = 2^{-x}$$



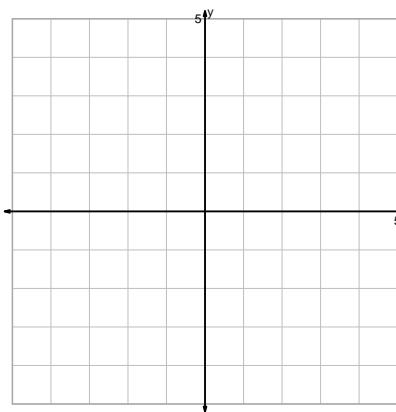
$$y = \log_2(x-2)$$

Question 2 continued...

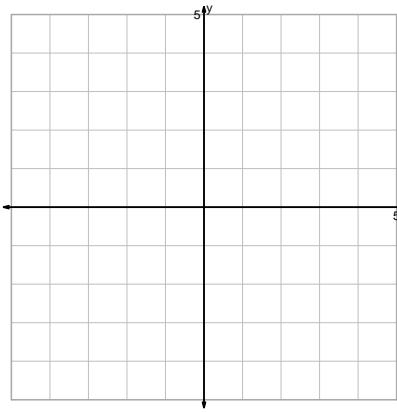
$$y = -\sqrt{x}$$



$$y = (x+2)^3$$

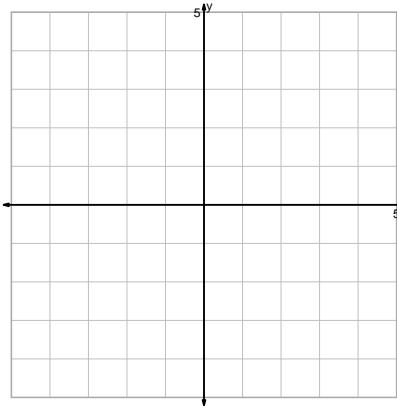


$$y = 2 \cdot 2^x$$



$$y = (2x)^3$$

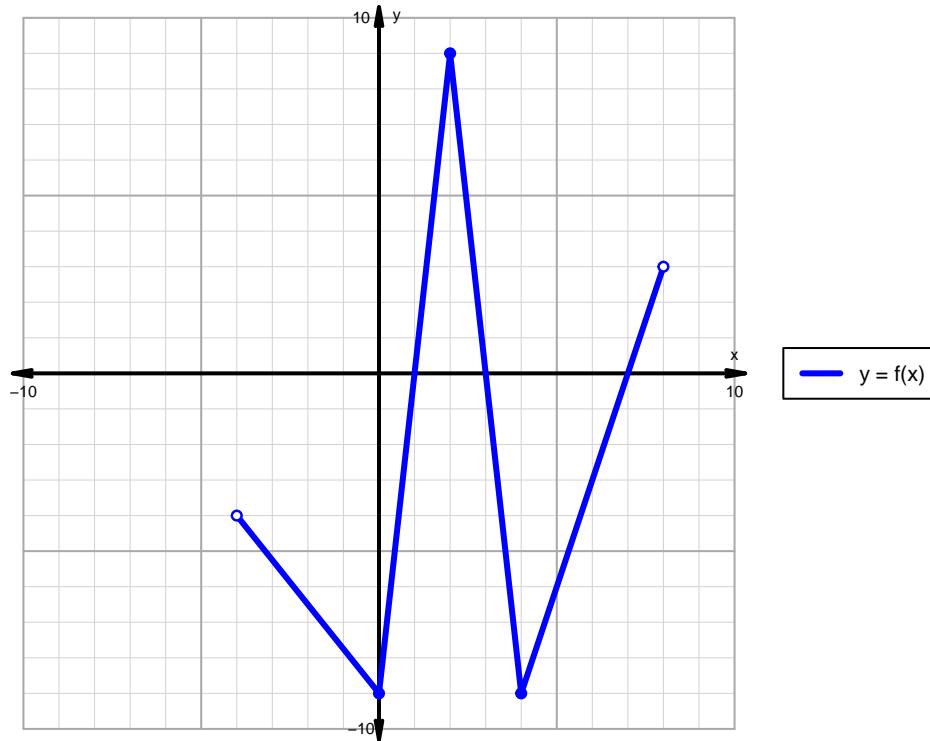
$$y = \sqrt[3]{\frac{x}{2}}$$



$$y = \sqrt[3]{x} - 2$$

Question 3 (20 points)

A function is graphed below.



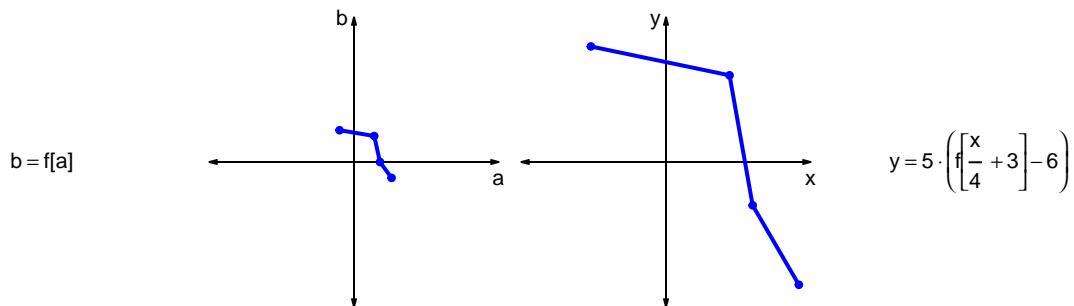
Indicate the following intervals using interval notation.

Feature	Where
Positive	
Negative	
Increasing	
Decreasing	
Domain	
Range	

Question 4 (20 points)

Let f represent a function. The curves $b = f[a]$ and $y = 5 \cdot (f[\frac{x}{4} + 3] - 6)$ are represented below in a table and on graphs.

a	b	x	y
-10	22	-52	80
14	18	44	60
18	0	60	-30
26	-11	92	-85



- a. Write formulas for calculating x from a and calculating y from b . (Or, write the coordinate transformation formula.)

 - b. What geometric transformations (using words like translation, stretch, and shrink), and in what order, would transform the first curve $y = f[x]$ into the second curve $y = 5 \cdot (f[\frac{x}{4} + 3] - 6)$?

Question 5 (10 points)

A parent square-root function is transformed in the following ways:

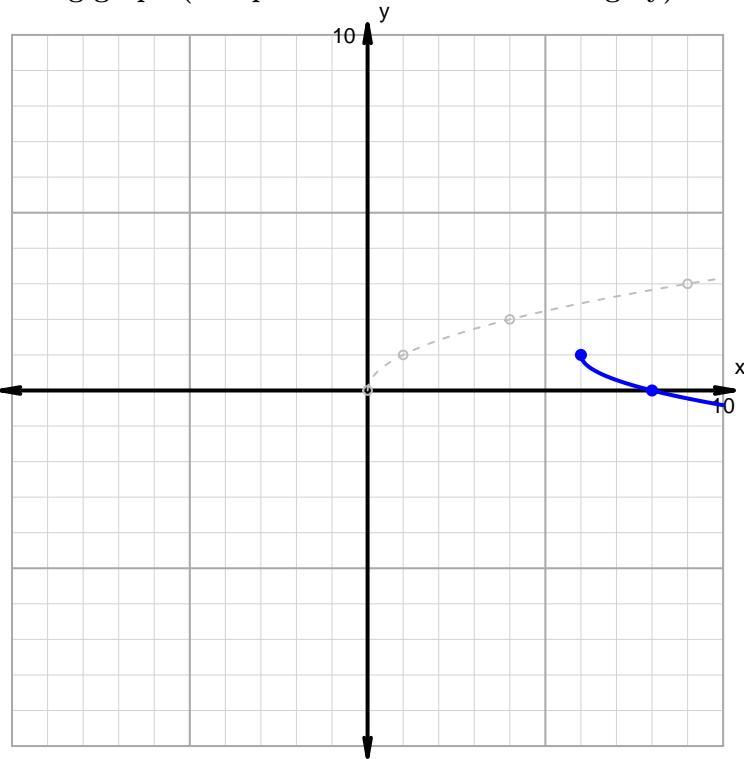
Horizontal transformations

1. Translate right by distance 3.
2. Horizontal stretch by factor 2.

Vertical transformations

1. Translate down by distance 1.
2. Vertical reflection over x axis.

Resulting graph (and parent function in dashed grey):



- What is the equation for the curve shown above?

Question 6 (20 points)

Make an accurate graph, and describe locations of features.

$$y = \frac{1}{3} \cdot |x + 4| - 1$$



Feature	Where
Domain	
Range	
Positive	
Negative	
Increasing	
Decreasing	